

AMENDMENTS TO THE CLAIMS

1. (canceled)

2. (previously presented) An apparatus for electroplating and thereby forming a metal film by way of an electroplating method, said apparatus comprising:

a plating chamber containing a holder for holding a substrate used in a large scale integration process and containing a plating bath;

a pre-treating chamber, in which a pre-treatment of said substrate to be plated is conducted, and

a transportation chamber connected to said pre-treating chamber by a first gate valve and connected to said plating chamber by a second gate valve,

wherein said pre-treating chamber, said transportation chamber, and said plating chamber are combined to be maintained together in a non-oxidative atmosphere.

3. (canceled).

4. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein:

said non-oxidative atmosphere is selected from the group consisting of a rare gas atmosphere, a nitrogen gas atmosphere and a hydrogen gas atmosphere.

5-7. (canceled).

8. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein:

said plating chamber includes a gas supply port for supplying said non-oxidative gas to said plating chamber and a gas evacuation port for evacuating gas contained in the plating chamber.

9. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein:

said metal is a copper film,

said plating chamber includes means for embedding said copper film in a groove or a connecting hole of said substrate in said plating bath, and

voids formed in said copper film include an inert gas forming said non-oxidative layer, and such that said copper film may be heat treated without oxidation of said film.

10. (canceled).

11. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein:

each of said pre-treating chamber, said transportation chamber, and said plating chamber individually includes an inert gas supply and a gas exhaust.

12. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein said plating bath comprises a plating solution for forming a plating on said substrate, said plating bath being maintained in said non-oxidative atmosphere, said plating containing a void having said non-oxidative atmosphere disposed therein.

13. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein said transportation chamber includes a transportation robot disposed therein, said transportation robot transporting said substrate.

14. (previously presented) An apparatus for electroplating as claimed in claim 2, wherein said transportation chamber is connected to a post-treating chamber by a third gate valve, connected to a loading side wafer container by a fourth gate valve, and connected to an unloading side wafer container by a fifth gate valve.

Please add the following new claims.

15. (new) An apparatus for electroplating, comprising:

means for pre-treating an article to be electroplated in a pre-treating zone;

means for transporting said article from said pre-treating zone; and

means for electroplating said article by immersing said article in an electroplating bath in a non-oxidative atmosphere;

wherein said functions of pre-treating, transporting, and electroplating are carried out in said non-oxidative atmosphere.

16. (new) The apparatus as set forth in claim 15, further including

means for heat treating said copper film without oxidation of said film.

17. (new) The apparatus as set forth in claim 15, further including

means for providing said electroplating bath inside a plating chamber, evacuating gas from said plating chamber, and supplying a non-oxidative gas to said plating chamber.

18. (new) The apparatus as set forth in claim 15 further including

means for loading and unloading said article in said electroplating bath in said non-oxidative atmosphere.

19. (new) The apparatus as set forth in claim 15, wherein

said non-oxidative atmosphere is selected from the group consisting of a rare gas atmosphere, a nitrogen gas atmosphere and a hydrogen gas atmosphere.

20. (new) The apparatus as set forth in claim 15 wherein

said means for electroplating further includes a function of embedding a copper film during said immersing function in a groove or a connecting hole of said article, so that any voids formed in said copper film include said non-oxidative atmosphere.

21. (new) The apparatus as set forth in claim 15, wherein

said means for electroplating further includes means for electroplating said article in said electroplating bath in said non-oxidative atmosphere.

22. (new) The apparatus as set forth in claim 15, further including

means for heat treating said copper film without oxidation of said film;

means for providing said electroplating bath inside a plating chamber, evacuating gas from said plating chamber, and supplying a non-oxidative gas to said plating chamber; and

means for loading and unloading said article in said electroplating bath in said non-oxidative atmosphere;

wherein said non-oxidative atmosphere is selected from the group consisting of a rare gas atmosphere, a nitrogen gas atmosphere and a hydrogen gas atmosphere,

wherein said means for electroplating further includes a function of embedding a copper film during said immersing function in a groove or a connecting hole of said article, so that any voids formed in said copper film include said non-oxidative atmosphere, and

wherein said means for electroplating further includes means for electroplating said article in said electroplating bath in said non-oxidative atmosphere.